SEQUENCE LISTING

<110> GOLDENBERG, DAVID M.
HANSEN, HANS J.
LEUNG, SHUI-ON

<120> CHIMERIC, HUMAN AND HUMANIZED ANTI-GRANULOCYTE ANTIBODIES AND METHODS OF USE

<130> 40923-0134US1

<140> 10/672,278
<141> 2003-09-29

<150> PCT/GB03/04229
<151> 2003-09-30

<150> 60/414,341
<151> 2002-09-30

<160> 51

<170> PatentIn Ver. 3.2

<210> 1
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino acid sequence

<400> 1
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 2
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino acid sequence

<400> 2
Lys Val Ser Asn Arg Phe Ser
1 5

<210> 3
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino
acid sequence

<400> 3
Phe Gln Gly Ser His Val Pro Pro Thr
1 5

<210> 4
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino
acid sequence

<400> 4
Asn Tyr Gly Met Asn
1 5

<210> 5
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino
acid sequence

<400> 5
Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe Lys
1 5 10 15

Gly

<210> 6
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric amino
acid sequence

<400> 6
Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr
1 5 10

<210> 7
<211> 4

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (2)
<223> Lys(HSG)

<220>
<221> MOD_RES
<222> (4)
<223> Lys(HSG)

<220>
<223> c-term amidated

<400> 7
Phe Lys Tyr Lys
1

<210> 8
<211> 392
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)..(339)

<400> 8
```
agc att gtg atg acc cag act cca ctc tcc ctg cct gtc agt ctt gga   48
Ser Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
  1               5                  10                  15

gat caa gcc tcc atc tct tgc aga tct agt cag agc att gta cat agt   96
Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
             20                  25                  30

aat gga aac acc tat tta gaa tgg tac ctg cag aaa cca ggc cag tct   144
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
         35                  40                  45

cca aac ctc ctc atc tac aaa gtt tcc aac cga ttt tct ggg gtc cca   192
Pro Asn Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
     50                  55                  60

gac agg ttc agt ggc agt gga tca ggg aca gat ttc aca ctc aag atc   240
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65                  70                  75                  80
```

```
agc aga gtg gag gct gag gat ctg gga gtt tat tac tgc ttt caa ggt   288
Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
                 85                  90                  95

tca cat gtt cct ccg acg ttc ggt gga ggc acc aag ctg gaa atc aaa   336
Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

cgg gctgatgctg caccaactgt atccatcttc ccaccatcca gtgaggatcc ggc    392
Arg
```

<210> 9
<211> 113
<212> PRT
<213> Mus musculus

<400> 9

```
Ser Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
  1               5                  10                  15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
             20                  25                  30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
         35                  40                  45

Pro Asn Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
     50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
                 85                  90                  95

Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 10
<211> 366
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)..(366)

<400> 10

```
cag gtc caa ctg cag gag tct gga cct gag ctg aag aag cct gga gag   48
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
  1               5                  10                  15
```

```
aca gtc aag ata tcc tgc aag gct tct ggg tat acc ttc aga aac tat    96
Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
             20                  25                  30

gga atg aac tgg gtg aaa cag gct cca gga aag ggt tta aag tgg atg   144
Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Lys Trp Met
         35                  40                  45

ggc tgg ata aac acc tac act gga gag cca aca tat gct gat gac ttc   192
Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

aag gga cgg ttt gcc ttc tct ttg gaa acc tct gcc agc act gcc tat   240
Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
 65                  70                  75                  80

ttg cag atc aac aac gtc aaa aat gag gac acg gct aca tat ttc tgt   288
Leu Gln Ile Asn Asn Val Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
                 85                  90                  95

gca aga aag gga tgg atg gat ttc aac ggt agt agc ctc gac tac tgg   336
Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110

ggc caa ggg acc acg gtc acc gtc tcc tca                          366
Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120
```

<210> 11
<211> 122
<212> PRT
<213> Mus musculus

<400> 11

```
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
  1               5                  10                  15

Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
             20                  25                  30

Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Lys Trp Met
         35                  40                  45

Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
 65                  70                  75                  80

Leu Gln Ile Asn Asn Val Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
                 85                  90                  95

Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110
```

```
Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120


<210> 12
<211> 339
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric
      cMN3Vk nucleotide sequence

<220>
<221> CDS
<222> (1)..(339)

<400> 12
gac atc cag ctg acc cag act cca ctc tcc ctg cct gtc agt ctt gga   48
Asp Ile Gln Leu Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
  1               5                  10                  15

gat caa gcc tcc atc tct tgc aga tct agt cag agc att gta cat agt   96
Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
             20                  25                  30

aat gga aac acc tat tta gaa tgg tac ctg cag aaa cca ggc cag tct   144
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
         35                  40                  45

cca aac ctc ctc atc tac aaa gtt tcc aac cga ttt tct ggg gtc cca   192
Pro Asn Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
     50                  55                  60

gac agg ttc agt ggc agt gga tca ggg aca gat ttc aca ctc aag atc   240
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65                  70                  75                  80

agc aga gtg gag gct gag gat ctg gga gtt tat tac tgc ttt caa ggt   288
Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
                 85                  90                  95

tca cat gtt cct ccg acg ttc ggt gga ggc acc aag ctg gag atc aaa   336
Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

cgt                                                               339
Arg


<210> 13
<211> 113
<212> PRT
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: Chimeric
cMN3Vk amino acid sequence

<400> 13
Asp Ile Gln Leu Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
1 5 10 15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
20 25 30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Asn Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
85 90 95

Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105 110

Arg

<210> 14
<211> 366
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric
cMN3VH nucleotide sequence

<220>
<221> CDS
<222> (1)..(366)

<400> 14
cag gtc caa ctg cag gag tct gga cct gag ctg aag aag cct gga gag 48
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
1 5 10 15

aca gtc aag ata tcc tgc aag gct tct ggg tat acc ttc aga aac tat 96
Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
20 25 30

gga atg aac tgg gtg aaa cag gct cca gga aag ggt tta aag tgg atg 144
Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Lys Trp Met
35 40 45

```
ggc tgg ata aac acc tac act gga gag cca aca tat gct gat gac ttc   192
Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

aag gga cgg ttt gcc ttc tct ttg gaa acc tct gcc agc act gcc tat   240
Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
 65                  70                  75                  80

ttg cag atc aac aac gtc aaa aat gag gac acg gct aca tat ttc tgt   288
Leu Gln Ile Asn Asn Val Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
                85                  90                  95

gca aga aag gga tgg atg gat ttc aac ggt agt agc ctc gac tac tgg   336
Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110

ggc caa ggg acc acg gtc acc gtc tcc tca                          366
Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120
```

<210> 15
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Chimeric
cMN3VH amino acid sequence

<400> 15

```
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
  1               5                  10                  15

Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
             20                  25                  30

Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Lys Trp Met
         35                  40                  45

Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
 65                  70                  75                  80

Leu Gln Ile Asn Asn Val Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
                85                  90                  95

Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110

Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120
```

<210> 16
<211> 108
<212> PRT
<213> Homo sapiens

<400> 16
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Ser Gln Asp Ile Ile Lys Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Thr Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Glu Ala Ser Asn Leu Gln Ala Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Phe Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Tyr Gln Ser Leu Pro Tyr
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Gln Ile Thr Arg
100 105

<210> 17
<211> 113
<212> PRT
<213> Mus musculus

<400> 17
Ser Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
1 5 10 15

Asp Gln Ala Ser Ile Ser Cys Gln Ser Ser Gln Ser Ile Val His Ser
20 25 30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Asn Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Ile Gly Val Tyr Tyr Cys Phe Gln Gly
85 90 95

Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105 110

Arg

<210> 18
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Humanized amino acid sequence

<400> 18
Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Ser Ile Ser Cys Gln Ser Ser Gln Ser Ile Val His Ser
20 25 30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Gln Gln Lys Pro Gly Lys Ala
35 40 45

Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile
65 70 75 80

Ser Ser Leu Gln Pro Glu Asp Ile Ala Thr Tyr Tyr Cys Phe Gln Gly
85 90 95

Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105 110

Arg

<210> 19
<211> 126
<212> PRT
<213> Homo sapiens

<400> 19
Pro Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Arg Ser
20 25 30

Ala Ile Ile Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45

Gly Gly Ile Val Pro Met Phe Gly Pro Pro Asn Tyr Ala Gln Lys Phe
50 55 60

Gln Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr
65 70 75 80

```
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys
                 85                  90                  95

Ala Gly Gly Tyr Gly Ile Tyr Ser Pro Glu Glu Tyr Asn Gly Gly Leu
            100                 105                 110

Val Thr Val Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser
        115                 120                 125


<210> 20
<211> 122
<212> PRT
<213> Mus musculus

<400> 20
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
  1               5                  10                  15

Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
             20                  25                  30

Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Lys Trp Met
         35                  40                  45

Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
 65                  70                  75                  80

Leu Gln Ile Asn Asn Val Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
                 85                  90                  95

Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110

Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120


<210> 21
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Humanized
      amino acid sequence

<400> 21
Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
  1               5                  10                  15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
             20                  25                  30
```

```
Gly Met Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
         35                  40                  45

Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
     50                  55                  60

Lys Gly Arg Phe Ala Phe Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr
 65                  70                  75                  80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys
                 85                  90                  95

Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
            100                 105                 110

Gly Gln Gly Thr Pro Val Thr Val Ser Ser
        115                 120
```

<210> 22
<211> 11
<212> PRT
<213> Homo sapiens

<400> 22
```
Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser
  1               5                  10
```

<210> 23
<211> 534
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic nucleotide sequence encoding light chain amino acid sequence

<220>
<221> CDS
<222> (21)..(64)

<220>
<221> CDS
<222> (147)..(495)

<400> 23
```
tctagacaca ggacctcacc atg gga tgg agc tgt atc atc ctc ttc ttg          50
                      Met Gly Trp Ser Cys Ile Ile Leu Phe Leu
                        1               5                  10

gta gca aca gct ac  aggtaagggg ctcacagtag caggcttgag gtctggacat       104
Val Ala Thr Ala Thr
                15
```

```
atatatgggt gacaatgaca tccactttgc ctttctctcc ac a ggt gtc cac tcc      159
                                                 Gly Val His Ser

gac atc cag ctg acc cag agc cca agc agc ctg agc gcc agc gtg ggt      207
Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 20                  25                  30                  35

gac aga gtg tcc atc tct tgt aga tcc agt cag agc att gta cat agt      255
Asp Arg Val Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
                 40                  45                  50

aat gga aac acc tat tta gaa tgg tac cag cag aag cca ggt aag gct      303
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Gln Gln Lys Pro Gly Lys Ala
             55                  60                  65

cca aag ctg ctg atc tac aaa gtt tcc aac cga ttt tcc gga gtg cca      351
Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
         70                  75                  80

gac aga ttc agc ggt agc ggt agc ggt acc gac ttc acc ttc acc atc      399
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile
     85                  90                  95

agc agc ctc cag cca gag gac atc gcc acc tac tac tgc ttt caa ggt      447
Ser Ser Leu Gln Pro Glu Asp Ile Ala Thr Tyr Tyr Cys Phe Gln Gly
100                 105                 110                 115

tca cat gtt cct ccg acg ttc ggc ggc ggg acc aag gtg gag atc aaa      495
Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
                120                 125                 130

cgtgagtaga atttaaactt tgcttcctca gttggatcc                          534
```

<210> 24
<211> 131
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
light chain amino acid sequence

<400> 24

```
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly
  1               5                  10                  15

Val His Ser Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala
             20                  25                  30

Ser Val Gly Asp Arg Val Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile
         35                  40                  45

Val His Ser Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Gln Gln Lys Pro
     50                  55                  60
```

```
Gly Lys Ala Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser
 65                  70                  75                  80

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
                 85                  90                  95

Phe Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala Thr Tyr Tyr Cys
            100                 105                 110

Phe Gln Gly Ser His Val Pro Pro Thr Phe Gly Gly Gly Thr Lys Val
        115                 120                 125

Glu Ile Lys
    130
```

<210> 25
<211> 729
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic nucleotide sequence encoding heavy chain amino acid sequence

<220>
<221> CDS
<222> (23)..(66)

<220>
<221> CDS
<222> (149)..(528)

<400> 25

```
ctcgagcaca caggacctca cc atg gga tgg agc tgt atc atc ctc ttc ttg       52
                         Met Gly Trp Ser Cys Ile Ile Leu Phe Leu
                           1               5                  10

gta gca aca gct ac  aggtaagggg ctcacagtag caggcttgag gtctggacat       106
Val Ala Thr Ala Thr
                15

atatatgggt gacaatgaca tccactttgc ctttctctcc ac a ggt gtc cac tcc      161
                                                 Gly Val His Ser

cag gtc caa ctg cag cag tct gga gct gag gtc aag aag cct gga tct       209
Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
 20                  25                  30                  35

agc gtc aag gtc tcc tgc aag gct tct ggg tat acc ttc aga aac tat       257
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Arg Asn Tyr
                40                  45                  50

gga atg aac tgg gtg aga cag gct cca gga cag ggt tta gag tgg atg       305
```

```
Gly Met Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
             55                  60                  65

ggc tgg ata aac acc tac acc ggt gag cca aca tat gct gat gac ttc      353
Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
         70                  75                  80

aag gga cgg ttt gcc ttc aca gcc gac gaa tct acc aac act gcc tat      401
Lys Gly Arg Phe Ala Phe Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr
     85                  90                  95

atg gag ctg tct agc ttg aga tct gag gac acg gct ttc tat ttc tgt      449
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys
100                 105                 110                 115

gca aga aag gga tgg atg gat ttc aac ggt agt agc ctc gac tac tgg      497
Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu Asp Tyr Trp
                120                 125                 130

ggc caa ggg acc ccg gtc acc gtc tcc tca ggtgagtcct tacaacctct      547
Gly Gln Gly Thr Pro Val Thr Val Ser Ser
            135                 140

ctcttctatt cagcttaaat agattttact gcatttgttg ggggggaaat gtgtgtatct  607

gaatttcagg tcatgaagga ctagggacac cttgggagtc agaaagggtc attgggagcc  667

cgggctgatg cagacagaca tcctcagctc ccagacttca tggccagaga tttataggat  727

cc                                                                 729
```

<210> 26
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
heavy chain amino acid sequence

<400> 26

```
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly
  1               5                  10                  15

Val His Ser Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Val Lys Lys
             20                  25                  30

Pro Gly Ser Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
         35                  40                  45

Arg Asn Tyr Gly Met Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu
     50                  55                  60

Glu Trp Met Gly Trp Ile Asn Thr Tyr Thr Gly Glu Pro Thr Tyr Ala
 65                  70                  75                  80
```

Asp Asp Phe Lys Gly Arg Phe Ala Phe Thr Ala Asp Glu Ser Thr Asn
85 90 95

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe
100 105 110

Tyr Phe Cys Ala Arg Lys Gly Trp Met Asp Phe Asn Gly Ser Ser Leu
115 120 125

Asp Tyr Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser
130 135 140

<210> 27
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic linker

<400> 27
Gly Gly Gly Ser
1

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 28
acagtcactg agctgg 16

<210> 29
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 29
gccggatcct gactggatgg tgggaagatg gataca 36

<210> 30
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 30
gacattcagc tgacccagtc tcca 24

<210> 31
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 31
ctcactggat ggtgggaaga tggatacagt tgg 33

<210> 32
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 32
aggtsmarct gcagsagtcw gg 22

<210> 33
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic probe

<400> 33
agactgcagg agagctggga aggtgtgcac 30

<210> 34
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic probe

<400> 34
gaagcacacg actgaggcac ctccagatgt 30

<210> 35
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic linker

<400> 35
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 36
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 36
Phe Lys Tyr Lys
1

<210> 37
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (1)
<223> Lys(DTPA)

<220>
<221> MOD_RES
<222> (3)
<223> Lys(DTPA)

<220>
<221> MOD_RES
<222> (4)
<223> Lys(Tscg-Cys); Cys not part of peptide backbone

<220>
<223> c-term amidated

<400> 37
Lys Tyr Lys Lys
1

<210> 38
<211> 149
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 38
ggctcaccgg tgtaggtgtt tatccagccc atccactcta aaccctgtcc tggagcctgt 60
ctcacccagt tcattccata gtttctgaag gtatacccag aagccttgca ggagaccttg 120
acgctagatc caggcttctt gacctcagc 149

<210> 39
<211> 149
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 39
tcgaggctac taccgttgaa atccatccat ccctttcttg cacagaaata gaaagccgtg 60
tcctcagatc tcaagctaga cagctccata taggcagtgt tggtagattc gtcggctgtg 120
aaggcaaacc gtcccttgaa gtcatcagc 149

<210> 40
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 40
ccaactgcag cagtctggag ctgaggtcaa gaagcct 37

<210> 41
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 41
ggctcaccgg tgtaggtgtt 20

<210> 42
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 42
acctacaccg gtgagccaac atatgctgat gacttcaagg gacg 44

<210> 43
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 43
ggtgaccggg gtcccttggc cccagtagtc gaggctacta ccgttga 47

<210> 44
<211> 140
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 44
gaaactttgt agatcagcag ctttggagcc ttacctggct tctgctggta ccattctaaa 60
taggtgtttc cattactatg tacaatgctc tgactggatc tacaagagat ggacactctg 120
tcacccacgc tggcgctcag 140

<210> 45
<211> 131
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 45
ggtcccgccg ccgaacgtcg gaggaacatg tgaaccttga aagcagtagt aggtggcgat 60
gtcctctggc tggaggctgc tgatggtgaa ggtgaagtcg gtaccgctac cgctaccgct 120
gaatctgtct g 131

<210> 46
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 46
cagctgaccc agagcccaag cagcctgagc gccagcgtgg g 41

<210> 47
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 47
ctggcactcc ggaaaatcgg ttggaaactt tgtagatcag cag 43

<210> 48
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 48
caaccgattt tccggagtgc cagacagatt cagcggt 37

<210> 49
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 49
gatctccacc ttggtcccgc cgccgaacgt cgg 33

<210> 50
<211> 13
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic linker

<400> 50
agcttgcggc cgc 13

<210> 51
<211> 13
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic linker

<400> 51
gatcgcggcc gca 13